

**Amendment to the Claims:**

The list of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

Claims 1-9 (canceled).

Claim 10 (currently amended): A production method of a plastic optical fiber, comprising the step of, at least once, annealing a plastic optical fiber obtained by heat-drawing an undrawn fiber obtained by melt spinning, at a circumferential velocity ratio between the front and rear rollers (circumferential velocity of a rear roller / circumferential velocity of a front roller) of 0.5 to 1.2 under heating conditions which satisfy  $4 \leq y \leq -1.5x + 330$  and  $(T_{gc} - 5)^{\circ}\text{C} \leq x \leq (T_{gc} + 110)^{\circ}\text{C}$  wherein  $T_{gc}$  represents a glass transition temperature of a core,  $x$  represents an annealing temperature ( $^{\circ}\text{C}$ ), and  $y$  represents an annealing time (seconds).

Claim 11 (original): The production method as claimed in claim 10, wherein a homopolymer of methyl methacrylate, or a copolymer comprising a methyl methacrylate unit and another monomer unit is used as the core.

Claim 12 (previously presented): The production method as claimed in claim 10, wherein the core of the plastic optical fiber comprises a homopolymer of methyl methacrylate, the heat drawing is carried out such that the birefringence absolute value of the core becomes  $3 \times 10^{-4}$  or higher, and the annealing is carried out at a circumferential velocity ratio between the front and rear rollers (circumferential velocity of the rear roller / circumferential velocity of the front roller) of not higher than 1 under conditions which satisfy  $x \leq (T_{gc} + 20)^{\circ}\text{C}$ , wherein  $T_{gc}$  represents the glass transition temperature of the core, and  $x$  represents an annealing temperature ( $^{\circ}\text{C}$ ).

Claim 13 (currently amended): The production method as claimed in claim 10[[, 11 or 12]], which has the step of carrying out annealing under the heating conditions twice or more.

Claim 14 (currently amended): A production method of a plastic optical fiber, comprising the step of fixed length annealing a plastic optical fiber obtained by the method as claimed in ~~any one of claim[[s]] 10 to 13~~ at a temperature not higher than ~~[(a glass transition temperature of a core) + 8]°C~~ (a glass transition temperature of a core + 8°)C.

Claim 15 (currently amended): A plastic optical fiber obtained by the method as claimed in any one of claims 10 to 14 and having a shrinkage stress occurring temperature obtained by thermomechanical analysis of not lower than ~~[[[]]]~~ (a glass transition temperature of a core~~[[D]]~~) - 35~~[[[]]]~~°C.

Claim 16 (original): The plastic optical fiber as claimed in claim 15, wherein the core comprises a homopolymer of methyl methacrylate and has a birefringence absolute value of not larger than  $2.0 \times 10^{-4}$ .

Claim 17 (currently amended): A plastic optical fiber obtained by the method as claimed in any one of claims 10 to 14, having a core which comprises a homopolymer of methyl methacrylate and has a birefringence absolute value of not smaller than  $1.5 \times 10^{-4}$ , and having a shrinkage stress occurring temperature obtained by thermomechanical analysis of not lower than ~~[[[]]]~~(a glass transition temperature of the core~~[[D]]~~) - 20~~[[[]]]~~°C.

Claim 18 (currently amended): The plastic optical fiber as claimed in claim 15[[, 16 or 17]], which exhibits a shrinkage ratio of not higher than 2% when heated at 90°C for 65 hours.

Claim 19 (currently amended): A plastic optical fiber cable obtained by forming a coating layer around the plastic optical fiber as claimed in ~~any one of claim[[s]] 15 to 18~~.

Claim 20 (original): A plugged plastic optical fiber cable obtained by attaching a plug on the tip of the plastic optical fiber cable as claimed in claim 19.

Claim 21 (canceled).

Claim 22 (original): A production method of a plastic optical fiber, comprising the step of annealing a plastic optical fiber obtained by melt spinning, at a temperature from (a glass transition temperature of a core  $- 5^{\circ}\text{C}$  to (the glass transition temperature of the core  $+ 80^{\circ}\text{C}$  while a tension of  $0.35 \times 10^6$  to  $1.5 \times 10^6$  Pa is applied to the fiber.

Claim 23 (original): The production method as claimed in claim 22, which has the step of heat-drawing a plastic optical fiber and carrying out the annealing after heat-drawing the plastic optical fiber.

Claim 24 (currently amended): The production method as claimed in claim [[21,]] 22 or 23, wherein a polymer containing a methyl methacrylate unit in an amount of not smaller than 70% by weight is used as the core of a plastic optical fiber.

Claim 25 (currently amended): The production method as claimed in claim 22 or 23, wherein a homopolymer of methyl methacrylate is used as the core of a plastic optical fiber and the annealing is carried out at a temperature not higher than (a glass transition temperature of the core  $+ 30^{\circ}\text{C}$  such that the core has a birefringence absolute value of not smaller than  $1.5 \times 10^{-4}$  and the plastic optical fiber has a shrinkage stress occurring temperature obtained by thermomechanical analysis of not lower than [ ] (the glass transition temperature of the core [ ] -  $20[ ]^{\circ}\text{C}$ .

Claim 26 (original): The production method as claimed in ~~any one of claims 21 to 25~~ claim 22 or 23, wherein the annealing is carried out by introducing a plastic optical fiber into an annealing zone substantially vertically to a horizontal plane.

Claim 27 (currently amended): The production method as claimed in ~~any one of claims 21 to 25~~ claim 22 or 23, wherein the annealing is carried out by use of a heating furnace disposed substantially horizontally with a plastic optical fiber to be annealed supported by a heating medium which provides buoyancy to the plastic optical fiber so as to cause the plastic optical fiber to travel within an annealing zone in a non-contact manner.

Claim 28 (currently amended): The production method as claimed ~~any one of claims 21 to 25~~ claim 22 or 23, wherein the annealing is carried out by alleviation treatment.

Claim 29 (currently amended): The production method as claimed in ~~any one of claims 21 to 25~~ claim 22 or 23, wherein the annealing is hot air annealing.

Claim 30 (currently amended): The production method as claimed ~~any one of claims 21 to 25~~ claim 22 or 23, wherein the annealing is carried out such that a produced plastic optical fiber exhibits a shrinkage ratio when heated at 90°C for 65 hours of not higher than 0.5%.

Claim 31 (currently amended): A production method of a plastic optical fiber cable, comprising the steps of obtaining a plastic optical fiber by the method as claimed in ~~any one of claims 21 to 25~~ claim 22 or 23, and then forming a coating layer around the obtained optical fiber.

Claim 32 (original): A production method of a plugged plastic optical fiber cable, comprising the steps of obtaining a plastic optical fiber cable by the method as claimed in claim 31, and then attaching a plug on the tip of the obtained optical fiber cable.

Claims 33 and 34 (canceled):

Claim 35 (new): The production method as claimed in claim 10, wherein the annealing step and the heat-drawing step are carried out continuously.



Claim 36 (new): The production method of a plastic optical fiber, comprising the step of fixed-length annealing a plastic optical fiber obtained by the method as claimed in claim 12 at a temperature not higher than (a glass transition temperature of a core + 8)°C.

Claim 37 (new): The plastic optical fiber as claimed in claim 17, which exhibits a shrinkage ratio of not higher than 2% when heated at 90°C for 65 hours.

Claim 38 (new): A plastic optical fiber cable obtained by forming a coating layer around the plastic optical fiber as claimed in claim 17.

Claim 39 (new): The production method as claimed in claim 10, wherein the annealing is carried out while a tension of  $0.35 \times 10^6$  to  $1.5 \times 10^6$  Pa is applied to the fiber.

Claim 40 (new): The production method as claimed in claim 39, wherein the annealing is carried out by introducing a plastic optical fiber into an annealing zone substantially vertically to a horizontal plane.

Claim 41 (new): The production method as claimed in claim 39, wherein the annealing is carried out by use of a heating furnace disposed substantially horizontally with a plastic optical fiber to be annealed supported by a heating medium which provides buoyancy to the plastic optical fiber so as to cause the plastic optical fiber to travel within an annealing zone in a non-contact manner.

Claim 42 (new): The production method as claimed in claim 39, wherein the annealing is carried out by alleviation treatment.

Claim 43 (new): The production method as claimed in claim 39, wherein the annealing is hot air annealing.

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Claim 44 (new): The production method as claimed in claim 39, wherein the annealing is carried out such that a produced plastic optical fiber exhibits a shrinkage ratio when heated at 90°C for 65 hours of not higher than 0.5%.

Claim 45 (new): A production method of a plastic optical fiber cable, comprising the steps of obtaining a plastic optical fiber by the method as claimed in claim 10, and then forming a coating layer around the obtained optical fiber.

Claim 46 (new): A production method of a plugged plastic optical fiber cable, comprising the steps of obtaining a plastic optical fiber cable by the method of claimed in claim 45, and then attaching a plug on the tip of the obtained optical fiber cable.